IN THE CLAIMS

The following amendments to the claims are made pursuant to the requirements of 37 C.F.R. § 1.121(c). A claim listing is provided beginning on the next page of this response.

Please cancel claims 13-16 without prejudice or disclaimer.

Please amend claims 1, 4, 6, 8-9, 12, and 17-20 as set forth below.

Please add new claims 21-22.

1. (currently amended) A laser digitizer comprising:

a light source having collimating optics configured to generate a collimated beam of light;

a scanner optically coupled to the light source and configured to scan the collimated beam along at least two axes towards an object to be imaged to generate a pattern comprising a set of curvilinear segments;

an image capture instrument having an optical axis at an angle θ with respect to the scanner and configured to detect a reflection of the ~~scanned beam~~ pattern from the object and to generate data representative of a surface of the object based on the ~~reflected beam~~ reflection of the pattern; and

a processor coupled to the scanner and the image capture system configured to generate a three-dimensional image of the object based on the data.

2. (original) The laser digitizer of claim 1 where the light source comprises a laser LED.

3. (original) The laser digitizer of claim 1 further comprising a flat-field scan lens having an optical axis and configured to focus the scanned beam of light to a point on the object to be imaged.

4. (currently amended) The laser digitizer of claim 3 where the image capture instrument comprises:

an image sensor configured to detect a triangulation image of the object, the triangulation image based on the pattern, wherein the pattern comprises a plurality of curves generated by scanning the beam of light on the object during an exposure period; and

a telecentric lens configured to focus the plurality of curves on the image sensor.

5. (original) The laser digitizer of claim 4 further comprising an object positioning system configured to position the object within a field of projection of the scanner.

6. (currently amended) The laser digitizer of claim 5 where the object positioning system is configured to move the object to various positions and angles with respect to a field of

view of the image ~~sensor~~ capture instrument and the scanner.

7. (original) The laser digitizer of claim 6 where the processor is programmed to merge multiple images of the object to create a three-dimensional map of the object.

8. (currently amended) The laser digitizer of claim ~~8~~ 1 where the object comprises any one of: a dental model, a dental mold, or a dental casting.

9. (currently amended) The laser digitizer of claim 1 where the scanner comprises ~~multiple~~ first and second mirrors, ~~where each mirror is~~ wherein the first and second mirrors are positioned substantially orthogonally with respect ~~each other~~ to one another.

10. (original) The laser digitizer of claim 1 where the scanner comprises a rotatable mirror and a spinning polygon mirror.

11. (original) The laser digitizer of claim 1 where the scanner further comprises a programmable position controller configured to control the scan of the collimated laser beam to a programmed scan sequence.

12. (currently amended) The laser digitizer of claim 1 ~~where the known pattern comprises a plurality of curves where~~ wherein each of the ~~plurality of curves~~ set of curvilinear segments is substantially parallel to ~~each other~~ one another.

13-16 (cancelled)

17. (currently amended) A method that generates a ~~three-dimensional visual image~~ representation of a physical object comprising:

generating a multi-axis collimated beam of light;

~~positioning the physical object in a first position;~~

~~scanning the multi-axis collimated beam of light in a predetermined pattern, where the pattern includes a plurality of substantially parallel curves;~~

~~focusing the scanned collimated beam of light on the physical object;~~

~~capturing an image of the focused collimated beam of light on the object during an exposure period; and~~

~~determining a map of the surface of the object based on the captured image~~

with the physical object in a first position relative to the multi-axis collimated beam of light and during a first exposure period, scanning the multi-axis collimated beam of light towards the physical object, and detecting a reflection of the scanned collimated multi-axis beam of light from the physical object at a given triangulation angle, wherein over the first exposure period the scanned multi-axis collimated beam of light generates a first pattern comprising a plurality of segments and the reflection comprises a modified first pattern;

with the physical object in a second position relative to the multi-axis collimated beam of light and during a second exposure period, scanning the multi-axis collimated beam of light towards the physical object, and detecting a reflection of the scanned collimated multi-axis beam of light from the physical object at a given triangulation angle, wherein over the second exposure period the scanned multi-axis collimated beam of light generates a second pattern comprising a plurality of segments and the reflection comprises a modified second pattern; and

generating the representation of the physical object from data associated with the first and second modified patterns.

18. (currently amended) The method of claim 17 ~~where the act of scanning comprises scanning the beam of light in a direction substantially perpendicular to the optical axis of a lens~~ wherein the representation is a given surface characteristic of the physical object.

19. (currently amended) The method of claim 17 ~~further comprising the acts of: re-positioning the object to a second orientation; capturing an image of the focused beam on the object positioned in the second position; and merging the image of the focused beam on the object positioned in the first position with the image of the focused beam on the object in the second position~~ wherein the physical object is one of: a dental item, a dental impression, a dental model, a dental mold and a dental casting.

20. (currently amended) The method of claim 17 ~~where the plurality of curves each~~

~~comprise a plurality of curvilinear segments~~ wherein each of the plurality of segments in at least one of the first and second patterns is a curve.

21. (new) A laser digitizer, comprising:

a structure in which an object to be imaged is supported;

a light source having collimating optics configured to generate a collimated beam of light;

a scanner optically coupled to the light source and configured to scan the collimated beam along at least two axes towards the object to be imaged, wherein over a given exposure period the scanned collimated beam of light generates a pattern comprising a plurality of segments, wherein the structure is positionable relative to the scanned collimated beam so that, during first and second exposure periods, first and second patterns are projected onto first and second portions of the object;

an image capture instrument configured to detect a reflection of the scanned collimated beam from the object at a given triangulation angle θ, wherein over the first exposure period the reflection comprises a modified first pattern and over the second exposure period the reflection comprises a modified second pattern; and

a processor, under program control, that uses data associated with the modified first and second patterns to generate a representation of the object.

22. (new) The laser digitizer as described in claim 21 wherein each segment is a curve.